

C L A I M S

What is claimed and desired to be secured by Letters Patent

is as follows:

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al*
1. An implant apparatus for positioning between adjacent vertebrae and comprising:
- a fusion cage having a pair of legs interconnected at one end each by a wall, said legs having free ends opposite said wall, said cage being adapted for implanting between said adjacent vertebrae with outer surfaces of said legs engaging said vertebrae respectively;
 - an expansion cap having a wedge member positioned between said free ends of said legs in such a manner that movement of said wedge member toward said wall urges said leg free ends apart; and
 - a fastener engaged between said wedge member and said wall and operable to selectively urge said wedge member toward said wall.

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2. The apparatus according to Claim 1 wherein:
- a) said expansion wedge member is selected from a set of a plurality of interchangeable wedge members; and
 - b) each wedge member being sized to form said apparatus into a different predetermined angle.

3. The apparatus according to Claim 1 wherein:
- a) said cage member includes an interior chamber for receiving bone fragments; and
 - b) a plurality of radially positioned apertures for permitting bone fragments in said chamber to join and fuse with bone in the adjacent vertebrae.

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4. An apparatus for positionally stabilizing adjacent vertebrae of a spine by promotion of bone fusion between the adjacent vertebrae, said apparatus comprising:

- a) an implant for implanting between a pair of adjacent vertebrae, said implant adapted to promote bone growth between the adjacent vertebrae;

- b) an expansion cap coupled with said implant for expanding an anterior portion of said implant for forming said implant into a predetermined angle to cause alignment of the adjacent vertebrae; and
- c) a fastener mechanism operably securing said expansion cap to said implant during use.

- 5. The apparatus according to Claim 4 wherein:
 - a) said expansion cap is selected from a set including a plurality of expansion caps; and
 - b) each cap of said set being sized to form said implant into a different predetermined angle.
- 6. The apparatus according to Claim 4 wherein:
 - a) said implant includes an interior chamber for receiving bone fragments; and
 - b) a plurality of radially positioned apertures for permitting bone fragments in said chamber to join and fuse with bone in the adjacent vertebrae.
- 7. An apparatus for positionally stabilizing adjacent vertebrae of a spine by promotion of bone fusion

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between the adjacent vertebrae, said apparatus comprising:

- a) a pair of anteriorly expandable implants for implanting in side-by-side relationship between a pair of adjacent vertebrae, each of said implants adapted to promote bone growth between the adjacent vertebrae;
- b) an expansion unit intercoupling said implants and expanding an anterior portion of each implant for forming said implants into a predetermined angle to cause alignment of the adjacent vertebrae; and
- c) fasteners securing said expansion module to each of said implants.

8. The apparatus according to Claim 7 wherein said implants each include:

- a) an interior chamber for receiving bone fragments; and
- b) a plurality of radially positioned apertures for permitting bone fragments in said chamber to join and fuse with bone in the adjacent vertebrae.

9. The apparatus according to Claim 7 wherein:
- said expansion unit includes a pair of expansion caps coupled by a connector.
10. The apparatus according to Claim 9 wherein:
- each of said expansion caps includes a face; and
 - said connector is recessed posteriorly from said expansion cap faces.
11. An apparatus for positionally stabilizing adjacent vertebrae of a spine by promotion of bone fusion between the adjacent vertebrae, said apparatus comprising:
- an anteriorly expandable implant adapted to promote bone growth between the adjacent vertebrae;
 - an expansion member coupled with said implant for expanding an anterior portion of said implant for forming said implant into a predetermined angle to cause alignment of the adjacent vertebrae;
 - a cover assembly having upper and lower support surfaces for supporting an anterior region of the adjacent vertebrae; and

d) a fastener mechanism operably securing said cover assembly and said expansion member to said implant during use.

12. The apparatus according to Claim 11 wherein:

a) said implant includes a rear wall; and
b) said fasteners include a bolt member fixedly coupled with said rear wall and extending forwardly therefrom for coupling with a nut for securing said cover and said expansion member to said implant.

13. The apparatus according to Claim 11 wherein:

a) said implant includes an interior chamber for receiving bone fragments; and
b) a plurality of radially positioned apertures for permitting bone fragments in said chamber to join and fuse with bone in the adjacent vertebrae.

14. An apparatus for positionally stabilizing adjacent vertebrae of a spine by promotion of bone fusion between the adjacent vertebrae, said apparatus comprising:
- a) an implant for implanting between a pair of adjacent vertebrae, said implant adapted to promote bone growth between the adjacent vertebrae;
 - b) an expansion cap coupled with said implant for expanding an anterior portion of said implant to a predetermined angle to cause alignment of the adjacent vertebrae; and
 - c) said expansion cap including upper and lower support surfaces for supporting an anterior region of said adjacent vertebrae.

15. The apparatus according to Claim 14 wherein:

- a) said expansion cap includes a recess for receiving a fastener to secure said cap to said implant.

16. The apparatus according to Claim 14 wherein:

- a) said implant includes an interior chamber for receiving bone fragments; and

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- b) a plurality of radially positioned apertures for permitting bone fragments in said chamber to join and fuse with bone in the adjacent vertebrae.
17. The apparatus according to Claim 14 wherein:
- a) said expansion cap and said implant include structure for cooperatively locking together said cap and said implant when fully joined.
18. An apparatus for stabilizing between adjacent vertebrae of a spine by promotion of bone fusion between the adjacent vertebrae, said apparatus comprising:
- a) a pair of anteriorly expandable implants for implanting in side-by-side relationship between a pair of adjacent vertebrae, each of said implants adapted to promote bone growth between the adjacent vertebrae;
 - b) a pair of expansion caps, each expanding an anterior portion of one of said implants for forming said implants into a predetermined angle to cause alignment of the adjacent vertebrae;

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- c) said expansion caps each including upper and lower support surfaces for supporting an anterior region of said adjacent vertebrae;
 - d) a connector for connecting said implants in spaced relationship; and
 - e) a fastening mechanism operably securing said connector to each of said implants during use.
19. The apparatus according to Claim 18 wherein:
- a) said expansion caps and said implants each include structure for cooperatively locking together said caps and said implants such that said implants are aligned in nonparallel configuration with respect to each other.
20. The apparatus according to Claim 18 wherein:
- a) each of said implants includes an interior chamber for receiving bone fragments; and
 - b) a plurality of radially positioned apertures for permitting bone fragments in said chamber to join and fuse with bone in the adjacent vertebrae.

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A method of stabilizing and promoting bone fusion between two adjacent vertebrae comprising the steps of:

- a) providing an implant adapted to promote bone growth;
- b) implanting said implant between a pair of adjacent vertebrae;
- c) providing an expansion cap adapted for expanding an anterior portion of said implant to a predetermined angle; and
- d) coupling said expansion cap with said implant and expanding said implant to a predetermined angle to cause alignment of the adjacent vertebrae.

22. The method according to Claim 21 wherein said step of providing an expansion cap includes the step of:

- a) providing a plurality of expansion caps of graduated sizes.

23. The method according to Claim 22 including the steps of:

- a) selecting a first expansion cap;
- b) coupling said first expansion cap with said implant and expanding said implant; and

c) removing said first expansion cap and repeating steps (a) through (c) with subsequent longer expansion caps, until said implant is expanded to a predetermined angle to cause alignment of the adjacent vertebrae.

24. In an expandable fusion cage apparatus having a fusion cage for insertion between vertebrae, the improvement comprising:

a) a set of interchangeable expansion caps of different sizes and cooperating with said fusion cage to allow a surgeon to selectively adjust the expansion of said fusion cage.

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25. In a fusion cage apparatus having a fusion cage for insertion between vertebrae, the improvement comprising:

a) an expansion cap for expanding said cage to a selected degree of expansion.

26. The apparatus according to Claim 25 wherein:

a) said cap includes upper and lower surfaces shaped, sized and positioned to engage an anterior region of the vertebrae.

27. The apparatus according to Claim 25 wherein:

a) said fusion cage is a threaded fusion cage that is cylindrical upon insertion between vertebrae.

28. The apparatus according to Claim 25 including:

a) a pair of cages and a pair of caps; and
b) said caps being joined together by a link.

29. The apparatus according to Claim 28 wherein:

a) said link is sized and positioned such that when said caps are joined with said cages, said cages are biased into non-parallel alignment with one another.



An implant apparatus for positioning between adjacent vertebrae and comprising:

a) a fusion cage having a pair of legs interconnected at one end each by a wall, said legs having free ends opposite said wall, said cage being adapted

- for implanting between said adjacent vertebrae with outer surfaces of said legs engaging said vertebrae respectively; and
- b) an expansion cap positioned between said free ends of said legs in such a manner that movement of said cap toward said wall urges said leg free ends apart and increase the spacing between the top and bottom of at least one end of said implant, said cap not expanding the size of said implant from side to side.

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